

PATENT SPECIFICATION

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G1W E4B1 E4B2 E4CW E4CX E4L8
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(72) Inventors ION TIGANAS and ION FEIMER

(54) LOAD-APPLYING APPARATUS FOR USE WITH A VEHICLE ROLLING BRAKE TESTING STAND

(71) We, INSTITUT DE STUDII SI CERCETARI TRANSPORTURI, a Rumanian Body Corporate, of Calea Grivitei 393, Bucharest, Rumania, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to load applying apparatus for use with a roller brake testing stand determining maximum braking forces of motor vehicles, irrespective of their loading.

At present the most frequently used system for detecting malfunctions in the brake systems of motor vehicles is a roller brake testing stand. The brake testing stand consists of two symmetrical parts each including an electric motor, a reduction gear box, and two driving rollers between which a wheel of a motor vehicle to be tested is placed.

The wheel of the motor vehicle is driven by the driving rollers at a certain speed. When the brakes of the motor vehicle are applied, a retarding force is exerted on the rollers by the tyre, which is equal to the braking force applied to that wheel. This force is, however, limited by the static coefficient of friction between the wheel and the roller, which is rather small: 0.57—0.7.

According to the present invention there is provided load-applying apparatus for use in conjunction with a roller brake stand determining the maximum braking force of a

on the roller and to move the wheel c of the roller by an upward movement of ram, a pressure fluid supply to the including fluid pressure control means table for the delivery of fluid at a des pressure, and fluid diverting means for effing movement of the ram in one or o direction.

An embodiment of the present inven will now be described with reference to accompanying drawings in which:

Fig. 1 is a schematic diagram illustra apparatus for determining maximum b ing forces of motor vehicles including l applying apparatus according to the sent invention;

Fig. 2 is a sectional elevation of the f sure regulator of the load-applying app tus; and

Fig. 3 is a plan view of the pressure r lator of the Fig. 2.

With reference to Figs. 1 to 3, load-ap ing apparatus for use with a roller b testing stand determining maximum b ing forces of motor vehicles comprise vertically arranged double acting hydra ram 1 which by means of brackets 2 holding systems 3 engages an axle 4 a motor vehicle placed on two pairs of ro 5 of the brake testing stand either to f the wheels of the vehicle against the ro or lift them up therefrom. Means shown) are provided anchoring the cylinder for downward movement of ram.



ERRATUM

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(72) Inventors ION TIGANAS and ION FEIMER

(54) LOAD-APPLYING APPARATUS FOR USE WITH A VEHICLE ROLLER:
BRAKE TESTING STAND

(71) We, INSTITUT DE STUDII SI CERCETARI TRANSPORTURI, a Rumanian Body Corporate, of Calea Grivitei 393, Bucharest, Rumania, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention relates to load applying apparatus for use with a roller brake testing stand determining maximum braking forces of motor vehicles, irrespective of their loading.

15 At present the most frequently used system for detecting malfunctions in the brake systems of motor vehicles is a roller brake testing stand. The brake testing stand consists of two symmetrical parts each including an electric motor, a reduction gear box, and two driving rollers between which a wheel of a motor vehicle to be tested is placed.

20 The wheel of the motor vehicle is driven by the driving rollers at a certain speed. When the brakes of the motor vehicle are applied, a retarding force is exerted on the rollers by the tyre, which is equal to the braking force applied to that wheel. This force is, however, limited by the static coefficient of friction between the wheel and the roller, which is rather small: 0.57—0.7.

25 According to the present invention there is provided load-applying apparatus for use in conjunction with a roller brake stand determining the maximum braking force of a motor vehicle, comprising a double-acting fluid operable ram for vertical location in the stand and adapted for securement in the stand to enable downward operative movement of the ram; an elongate bar for location transversely of the vehicle, to an intermediate portion of which bar the ram is attached, spaced coupling devices on the bar engageable with an axle or wheel suspension member of the vehicle to force a wheel of the vehicle against a roller of the stand by a downward operative movement of the ram when the wheel is positioned

on the roller and to move the wheel clear of the roller by an upward movement of the ram, a pressure fluid supply to the ram including fluid pressure control means settable for the delivery of fluid at a desired pressure, and fluid diverting means for effecting movement of the ram in one or other direction.

30 An embodiment of the present invention will now be described with reference to the accompanying drawings in which:

35 Fig. 1 is a schematic diagram illustrating apparatus for determining maximum braking forces of motor vehicles including load-applying apparatus according to the present invention;

40 Fig. 2 is a sectional elevation of the pressure regulator of the load-applying apparatus; and

45 Fig. 3 is a plan view of the pressure regulator of the Fig. 2.

50 With reference to Figs. 1 to 3, load-applying apparatus for use with a roller brake testing stand determining maximum braking forces of motor vehicles comprises a vertically arranged double acting hydraulic ram 1 which by means of brackets 2 and holding systems 3 engages an axle 4 of a motor vehicle placed on two pairs of rollers 5 of the brake testing stand either to force the wheels of the vehicle against the rollers or lift them up therefrom. Means (not shown) are provided anchoring the ram cylinder for downward movement of the ram.

55 A hydraulic circuit for the ram 1 includes an oil reservoir 6, a hydraulic pressure pump 7 driven by an electric motor 8, a first hydraulic distributor 9 located on an operator's desk and adapted to initiate movement of the hydraulic ram in one or other direction, a second hydraulic distributor 10 located near the hydraulic ram and adapted to repeat the operations of the distributor 9, hydraulic fluid pipes 11 connecting the elements of the hydraulic circuit, a pressure regulator A for controlling the pressure of fluid in pipes 11, and a manometer or pres-

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sure gauge 12 for measuring the actual pressure in the pipes 11 for use in setting the pressure regulator A as will be explained below, the regulator A and gauge 12 being located on the operator's desk.

The pressure regulator A is in the form of a pressure relief valve (see Fig. 2) fluidly connected to the pipe 11 by connection 21 and includes a diverting branch 22 for diversion of oil to the oil reservoir 6 when the oil pressure exceeds a predetermined value. Oil flow through the diverting branch is controlled by a valve piston 20 movable rightwards as viewed in Fig. 2 by the oil in pipe 11 but biased leftwards to a diversion closure position by a helical spring 19 located between end caps 17, 18. End cap 18 engages piston 20, while cap 17 is axially movable by a shaft 16 which is threaded to a body part of the regulator A and is rotatable by a wheel 15 keyed to the shaft 16. Wheel 15 is rotated by pinion 14 which is manually adjustable by handle 13 to alter the tension of spring 19 and thereby the pressure setting of the valve. The pinion 14 is also rotatably coupled to an elongate threaded shaft 23, and a rotationally restrained indicator element 24 is threaded on the shaft 23 to thereby be axially movable on rotation of pinion 14 for indication of the valve setting on a scale 25. The scale 25 includes an upper portion indicating the pressure setting and a lower portion indicating the set load applied to the axle of the vehicle. A threaded stud 27 threadingly engages head 26 fixed to scale 25 and is adjustable to move the scale 25, and the scale can thereby be set to the correct datum after ascertaining the actual pressure in pipes 11 by means of gauge 12.

Using the above described apparatus the following advantages are obtained:

- the maximum braking forces of motor vehicles may be determined on existing roller brake testing stands irrespective of their loads, thus providing precision in the evaluation of the braking capacity of the vehicle;

- the interpretation of the results obtained, on the roller brake testing stand is possible for any kind of motor vehicle, even if a particular one is tested for the first time on the stand and the braking force characteristic dependent on the force that presses the brake pedal is unknown;

- the results thus obtained are valid for any kind of friction material used for brakes;

- the results are gained rapidly, without calculations and interpretations, thus excluding errors;

- the hydraulic ram can also be used, due to its double action for lifting up the wheel clear of the rollers, thus enabling convenient adjustment of the brakes with

the vehicle at the testing location. In this case the full force of the ram would be used.

WHAT WE CLAIM IS:—

1. Load-applying apparatus for use in conjunction with a roller brake stand determining the maximum braking force of a motor vehicle, comprising a double-acting fluid operable ram for vertical location in the stand and adapted for securing in the stand to enable downward operative movement of the ram; an elongate bar for location transversely of the vehicle, to an intermediate portion of which bar the ram is attached, spaced coupling devices on the bar engageable with an axle or wheel suspension member of the vehicle to force a wheel of the vehicle against a roller of the stand by a downward operative movement of the ram when the wheel is positioned on the roller and to move the wheel clear of the roller by an upward movement of the ram, a pressure fluid supply to the ram including fluid pressure control means settable for the delivery of fluid at a desired pressure, and fluid diverting means for effecting movement of the ram in one or other direction.

2. Apparatus as claimed in claim 1, wherein fluid pressure indicating means are provided enabling the setting of the pressure fluid control means to be checked.

3. Apparatus as claimed in claim 1 or 2, wherein the pressure fluid is oil and the fluid supply includes an oil reservoir, and a hydraulic pressure pump driven by a drive motor.

4. Apparatus as claimed in any one of the preceding claims, wherein the fluid pressure control means and a mechanism for operation of the fluid diverting means are positioned remote from the ram for convenience of the operator, and fluid diverting means is positioned adjacent the ram and is actuatable for movement of the ram in one direction or the other.

5. Apparatus as claimed in Claim 3, wherein the fluid pressure control means comprises a pressure relief valve connected to the line supplying the pressure oil to the ram; the pressure relief valve including a diverting portion for diversion of oil to the oil reservoir when a selected oil pressure is exceeded, a valve member for control of oil flow through said diverting portion and movable by the oil, a spring for biasing said valve member to a position closing said diverting portion, manually operable setting means for setting the tension of said spring and thereby the set pressure of the valve, and indicating means operatively coupled to said setting means for indicating the pressure setting.

6. Apparatus as claimed in claim 5, wherein an adjuster is provided to adjust the datum of said indicating means.

7. Apparatus as claimed in claim 5 or
6, wherein the indicating means includes a
first gauge providing a visual indication of
the desired oil pressure in the supply line,
and a second gauge indicating the desired
force exerted on the tested vehicle by a
downward operative movement of the ram.
8. Load-applying apparatus for use with
a roller brake testing stand substantially as
hereinbefore described with reference to and
as illustrated in the accompanying draw-
ings.

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Sheet 1

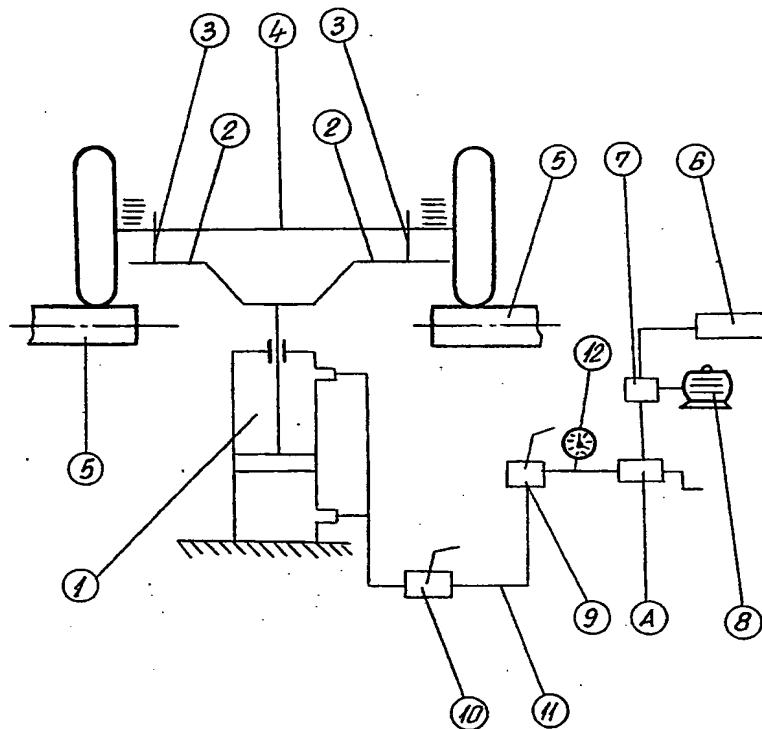


Fig. 1

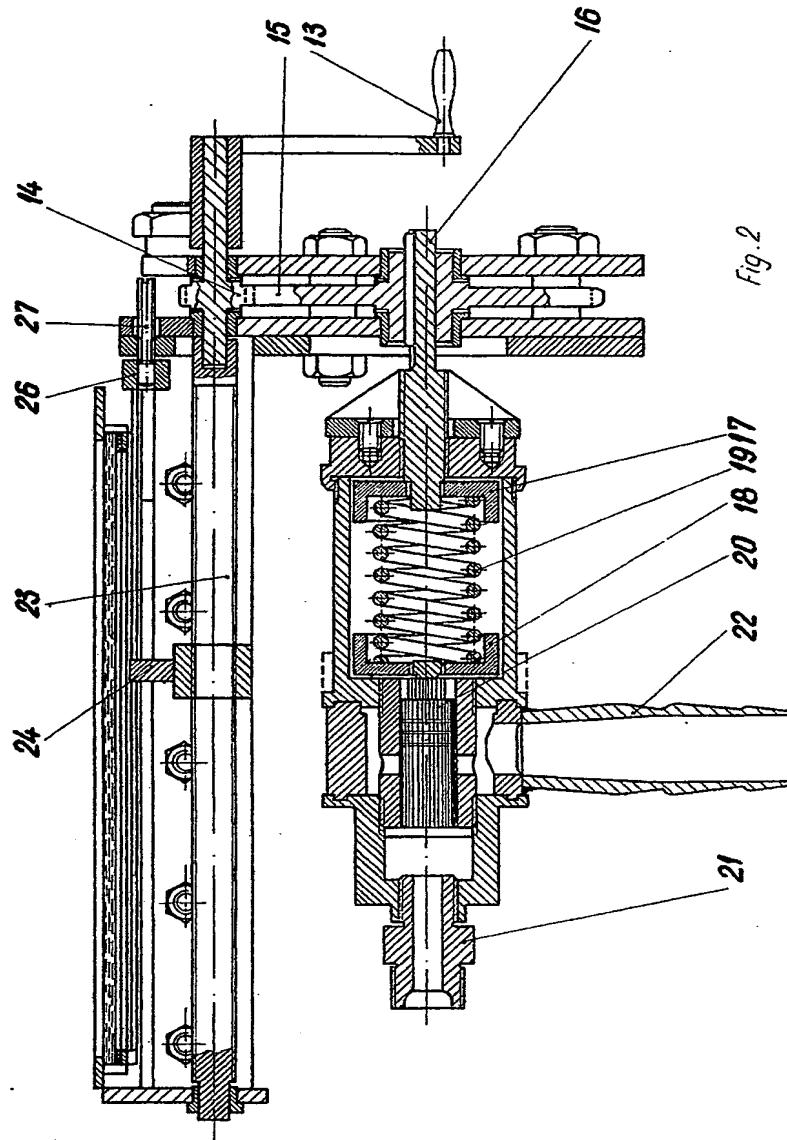
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Sheet 2



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Sheet 3

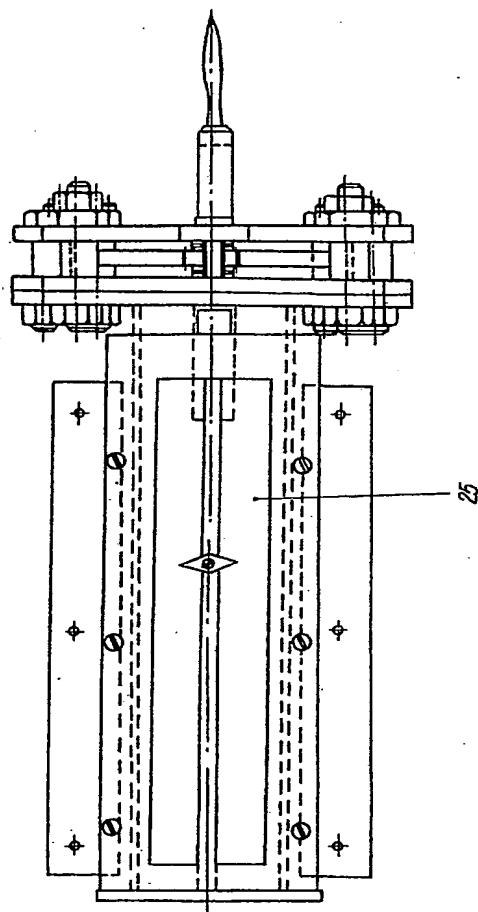


Fig. 3

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